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PIONEER

Service Manual

REPAIR & ADJUSTMENTS

ORDER NO.
ART-713-0

STEREO TURNTABLE

PL-2
PL-120

MODEL PL-2 COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KUT	120V only	U.S.A. model (Without cartridge)
KCT	120V only	Canada model (Without cartridge)
WE	220V – 240V	Europe model
WB	220V – 240V	United kingdom model
WP	220V – 240V	Oceania model
R	110V–120V/220V–240V (Switchable)	General export model

MODEL PL-120(which is minor change in design from PL-2) COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
WE	220V – 240V	Europe model
WB	220V – 240V	United kingdom model
WP	220V – 240V	Oceania model
R	110V–120V/220V–240V (Switchable)	General export model

- This is the service manual for model PL-2/KUT. For servicing of the other types, please refer to the additional service manual.
- Ce manuel d'instruction se refère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

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■ **For the circuit and mechanism descriptions, please refer to the supplement of model PL-7 service manual (ART-768).**

CONTENTS

1. SPECIFICATIONS

Motor and Turntable

Drive System . . . . . Belt-drive
Motor . . . . . DC motor
Turntable Platter . . . . . 310mm diam. aluminum alloy die-cast
Speeds . . . . . 33-1/3 and 45rpm
Wow and Flutter . . . . . Less than 0.05% (WRMS)
Signal-to-Noise Ratio . . . . . More than 68dB (DIN-B)
(with Pioneer cartridge model PC-220)

Tonearm

Type . . . . . Static-balance type, Straight pipe arm
Effective Arm Length 221mm
Overhang 15.5mm
Usable Cartridge Weight . . . . . 3g (min.) to 8g (max.)

Subfunctions

Auto-return mechanism, Anti-skating force control, Stylus pressure direct-readout counterweight, Cueing device, Free stop hinges

Miscellaneous

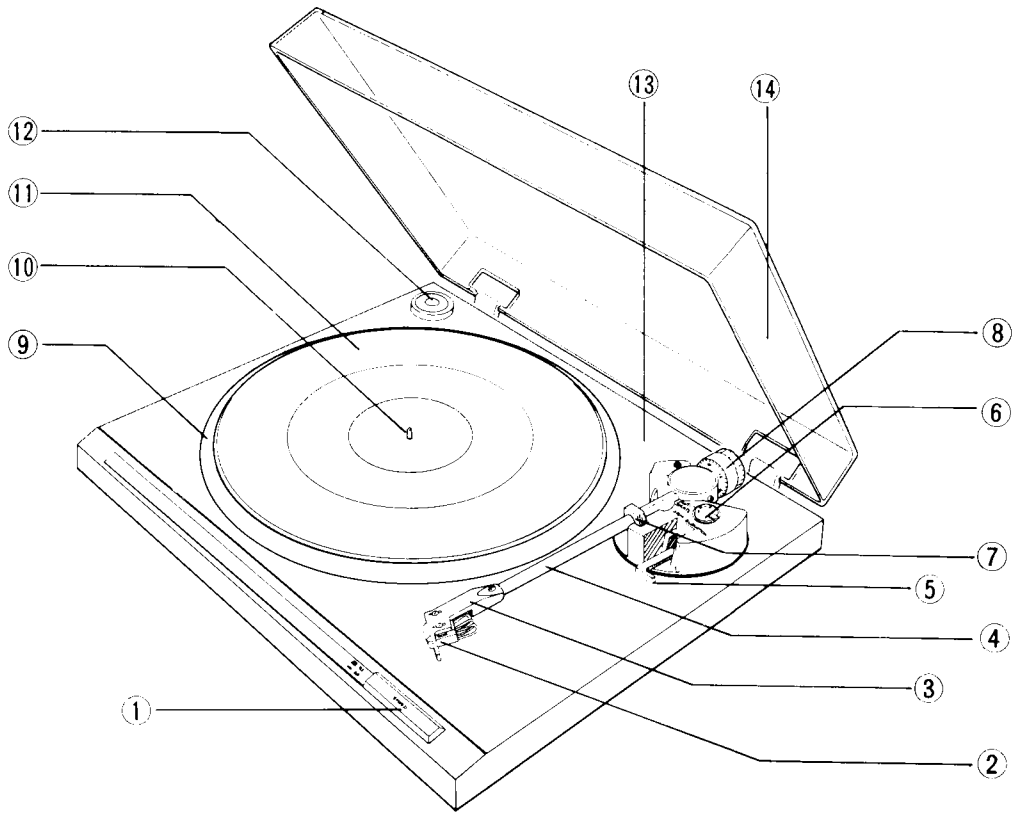
Power Requirements AC120V, 60Hz
Power Consumption 3W
Dimensions . . . . . 420(W) X 108(H) X 367(D)mm
16-1/2(W) X 4-1/4(H) X 14-7/16(D)in.
Weight . . . . . 5.1kg/11 lb 4 oz

Accessories

EP Adapter 1
Operating Instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

2. FRONT PANEL FACILITIES



① SPEED switch
Set this switch in accordance with the speed of the record which is to be played.
[33] (depressed position): For 33-1/3 rpm records
[45] (released position): For 45 rpm records

② Cartridge

③ Headshell

④ Tonearm

⑤ ARM ELEVATION lever
Operate this lever when starting record play or when temporarily suspending play.

⑥ ANTI-SKATE control
This is rotated when performing the anti-skating adjustment.

⑦ Arm rest
This serves to hold and clamp the tonearm. When moving the tonearm, release the clamp.

⑧ Tracking force adjustment weight
This is used when adjusting the tracking force.

⑨ Platter

⑩ Platter mounting shaft

⑪ Rubber mat

⑫ EP adapter
This is used when playing records without a "middle."

⑬ Cabinet

⑭ Dust cover

3. DISASSEMBLY

3.1 PANEL AND BASE

In removing the panel, follow the below listed steps in the order given. Using any unnecessary force will result in bending the springs or damaging other parts.

Panel removal steps

1. Remove the headshell and weight assembly, and the weight shaft assembly.
   The weight shaft assembly is removed by loosening screw (Hexagone socket screw) and the headshell by loosening screw ❶.
2. Lift off the turntable platter.
3. Loosen insulator attachment screws ❷ and remove the insulator. (Do not mix the color-coded float springs. They must be replaced with their original insulators during reassembly.)
4. Remove the rear panel PU cord strain relief.
5. Lift the front section of the panel (operating controls) very slightly
6. Unplug the 2p connector.
7. Completely remove the PU cord from the panel.
8. Taking care not to damage the tonearm, remove it from the panel. (Hold the tonearm steady.)

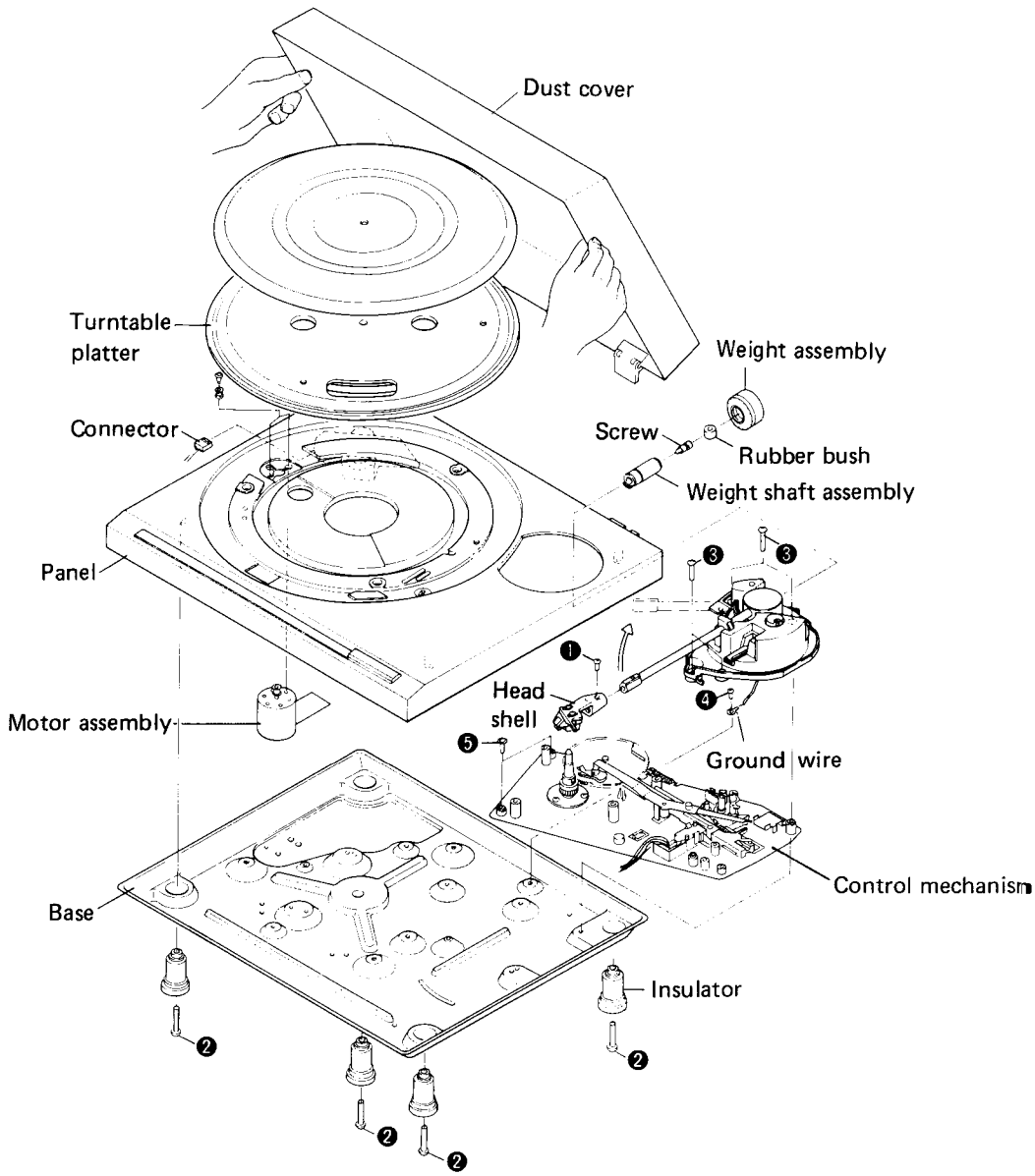


Fig. 3-1 Disassembly

3.2 TONEARM

1. Disconnect the tonearm lead wires from the PU board (See Fig. 3-2).
   Note that some of the lead wires have been soldered to the PU board, and must be disconnected with care.
2. Loosen the set screw ❻ with a screwdriver to remove the PU plate under the arm base (See Fig. 3-3).
3. Undo the screw ❼ securing the tonearm to the arm base (See Fig. 3-3).

3.3 TONEARM SECTION

Remove the tonearm section by taking out the three arm base attachment screws ❸ and one ground wire securing screws ❹.

3.4 CONTROL MECHANISM SECTION

After the tonearm section has been removed, loosen the three control mechanism attachment screws ❺ and remove the assembly.

3.5 PANEL AND BASE REASSEMBLY

1. Attach the PU cord stopper.
2. Attach the insulators. (Make certain the color-coded float springs are attached to the correct insulators.)
3. Attach the weight shaft assembly.

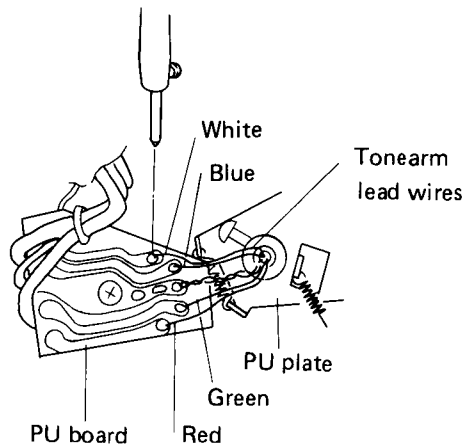


Fig. 3-2 Disconnect the tonearm lead wires

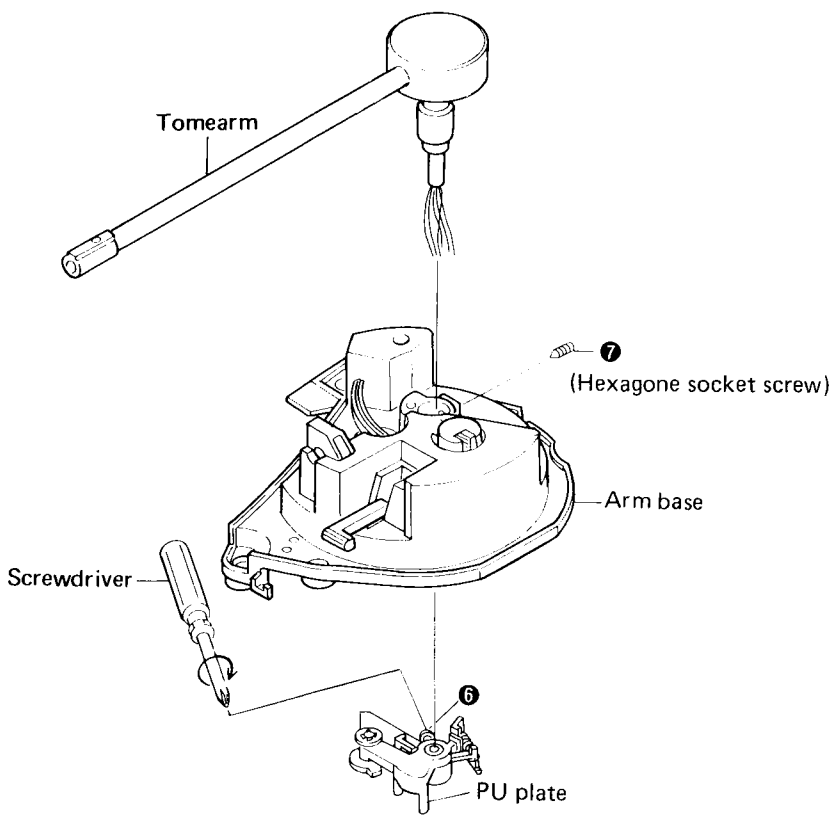


Fig. 3-3 Remote tonearm

4. TROUBLESHOOTING

Use the following directions to find the cause of each type of breakdown. Improper adjustment units should be completely readjusted.

■ AUTO-RETURN DOES NOT WORK

Change in starting position adjustment.

YES

Starting plate does not follow the signal plate. — NO →
- Too much grease between the signal hole is small.
- Inner diameter of the starting plate hole is small.
- Protrusions on the caulk section of the starting plate hole.
- Not enough grease between the starting plate and signal plate.

YES

After starting, incomplete reset of the signal plate. (See section 1) — NO → The curved section of the signal plate is deformed.

YES

The inner areas of records can not be tracked. — NO →
- Arm lead wire is caught on something.
- PU cord is touching the PU plate.
- Operator of the detection lever is not smooth.

YES

Looseness in the PU plate attachment.

Section 1

After performing the return operation, if the curved section of the signal plate and curved section of the starting plate are not in contact with surfaces Ⓐ and Ⓑ respectively of the cam, reset will be incomplete and the starting position will be late. As a result, the return function may not operate at times. In this case, bend the signal plate Ⓒ so that dimension Ⓐ is 0.5mm or larger.

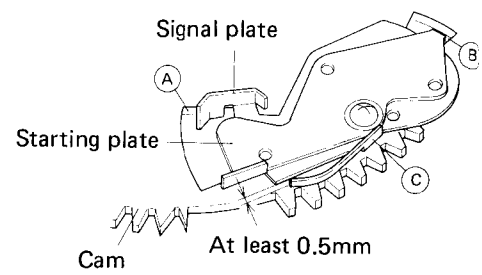


Fig. 4-1 Incomplete reset of starting and signal plates.

■ RETURN IS FAST (RETURN AT 1mm PITCH)

Protrusions on the pinion gear section
(See Section 2)

Section 2

If there are rough areas of plastic protruding from the Ⓐ section of the protruding section of the pinion gear, the return function may operate at a pitch of only 1mm. In this case, remove the plastic protrusions completely (Fig. 4-2).

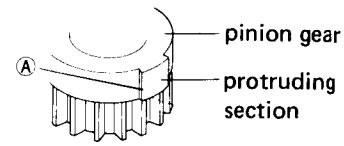


Fig. 4-2 Elimination of pinion gear protrusions

■ MOTOR DOES NOT ROTATE

2P connector is not attached.

↓

Connector is not properly installed.

■ MOTOR DOES NOT STOP

The switch lever and switch locker are not locking (See section 3). → The installation location of the PU plate is incorrect.

Section 3

In order to turn the power OFF, the PU plate shaft touches surface Ⓐ of the switch locker pushing it over so it locks with the switch lever turning the microswitch OFF (Fig. 4-3). If the amount of push on the switch locker is insufficient, it can not lock with the switch lever. With the tonearm locked in the arm rest, as shown in figure 4-4, attach the PU plate precisely midway between the first and second points from the arm base scale mark counting away from you.

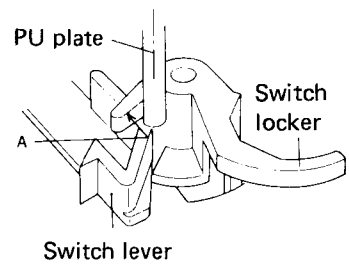


Fig. 4-3 Adjustment of switch locker

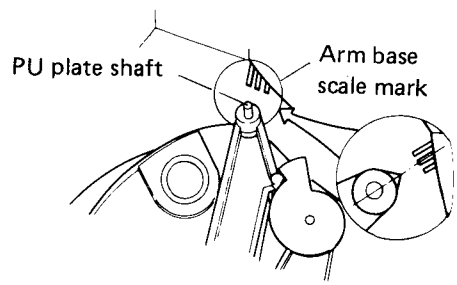


Fig. 4-4 Adjustment PU plate

5. PRECAUTIONS FOR REASSEMBLY

Follow these directions and precautions when reassembling a unit after completing repairs. Be sure to lubricate as required, make no mistakes when attaching parts, and avoid all other careless mistakes that may be the cause of trouble later on.

5.1 AREAS THAT REQUIRE LUBRICATION

NOTE:
Types of lubricants and areas where they are used are listed in table 1.

Table 1

Type of Oil	Areas used
Silicon Oil #100000 (GEM-002)	raising shaft
GYA-008	all other areas

Lubrication points are specified for oils other than GYA-008. Never use a different type of oil.

- **Cam Section**

Apply oil to the heart-shaped grooved section (rear side of the cam) and lock plate sliding section in order to minimize wear on the sliding section and the burden on the mechanism.

- **Driving Plate Assembly**

Decrease the burden on the mechanism and the wear on the sliding section.

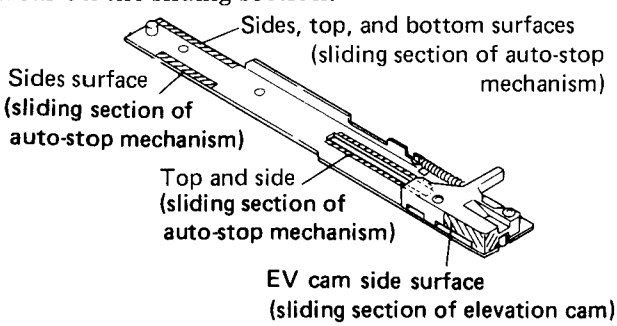


Fig. 5-1 Driving panel assembly section

- **Switch Locker Section**

Apply oil to the switch locker (opening) and sub-panel base sliding section to decrease the burden on the mechanism.

When applying oil to the opening (shaft hole), do not apply any oil 2—3mm from the bottom surface. If oil is applied 2—3mm within the bottom surface, it may come out the bottom and go between the switch lever and sub-panel base causing the switch lever to operate ineffectively.

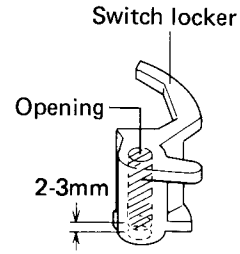


Fig. 5-2 Switch locker section

- **EV Lever Unit Section**

Apply oil to the sliding section of leaf spring (A) and EV lever unit to decrease the burden on the mechanism.

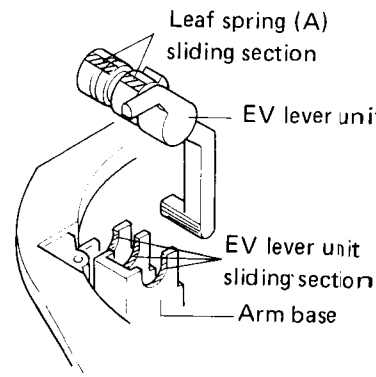


Fig. 5-3 EV lever unit section

- **Elevation Cam Section**

Apply oil to the elevation cam and sliding section of the raising shaft to decrease the burden when operated.

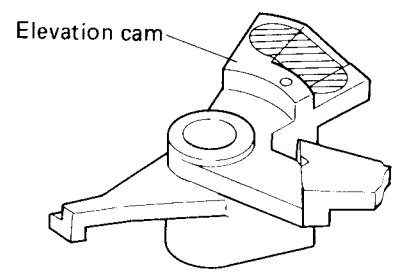


Fig. 5-4 Elevation cam section

- **EV Sheet Section**

Apply oil to the raising shaft and sliding section of the bearing to assure stability in the elevation lowering speed.

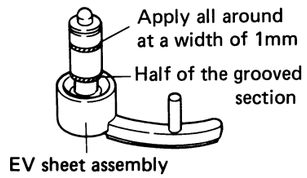


Fig. 5-5 EV sheet section

5.2 PRECAUTIONS FOR ATTACHMENT OF PARTS AND REASSEMBLY

- **Motor Attachment**

When installing the motor, set the cam in the mechanism stop location and verify that the starting plate section B does not protrude beyond surface A of the cam. If the motor is attached with the starting plate section B protruding, the starting plate may be deformed, the motor pinion gear may be scratched, and the return function may be damaged.

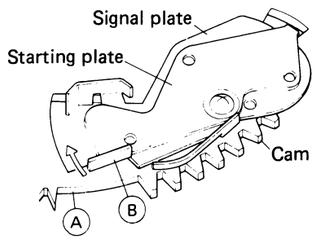


Fig. 5-6 Motor attachment

- **PU Plate Attachment**

Push the PU plate into place so that the PU plate bearing section touches the revolution shaft attachment nut. Installation direction is as shown in figure 5-7. Note that there is a difference between auto-return and fully automatic models.

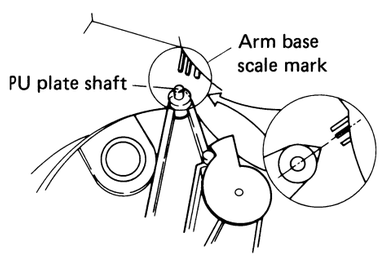


Fig. 5-7 PU plate attachment

- **AS Knob Attachment**

When installing the AS knob, put the AS knob rib against the AS knob revolution control stopper (attached to the arm base) and affix with the screw. As the stopper may break, be sure to press the AS knob down firmly when installing it.

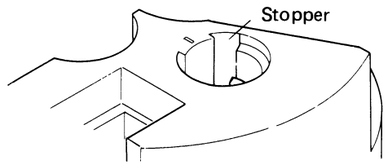


Fig. 5-8 AS knob attachment

- **Arm Base Attachment**

When attaching the arm base section to the mechanism section, put the mechanism section switch locker and switch lever in the locked position and verify that the tonearm is in the arm rest location. Also be sure to put the manual elevation lever in the up position and check that the PU plate shaft is in the position shown in figure 5-9.

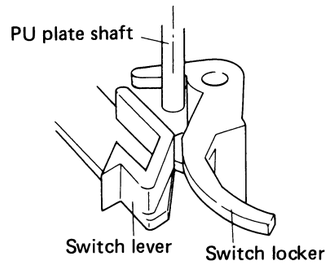


Fig. 5-9 Arm base attachement

- **Wiring the Connector**

When attaching the wires to the 2P connector from the microswitch, bend the lead wires from the connector housing as shown in figure 5-10 before attaching.

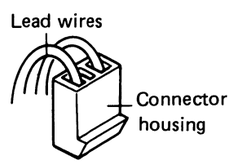


Fig. 5-10 Start lever unit attachment

6. ELECTRICAL PARTS LIST

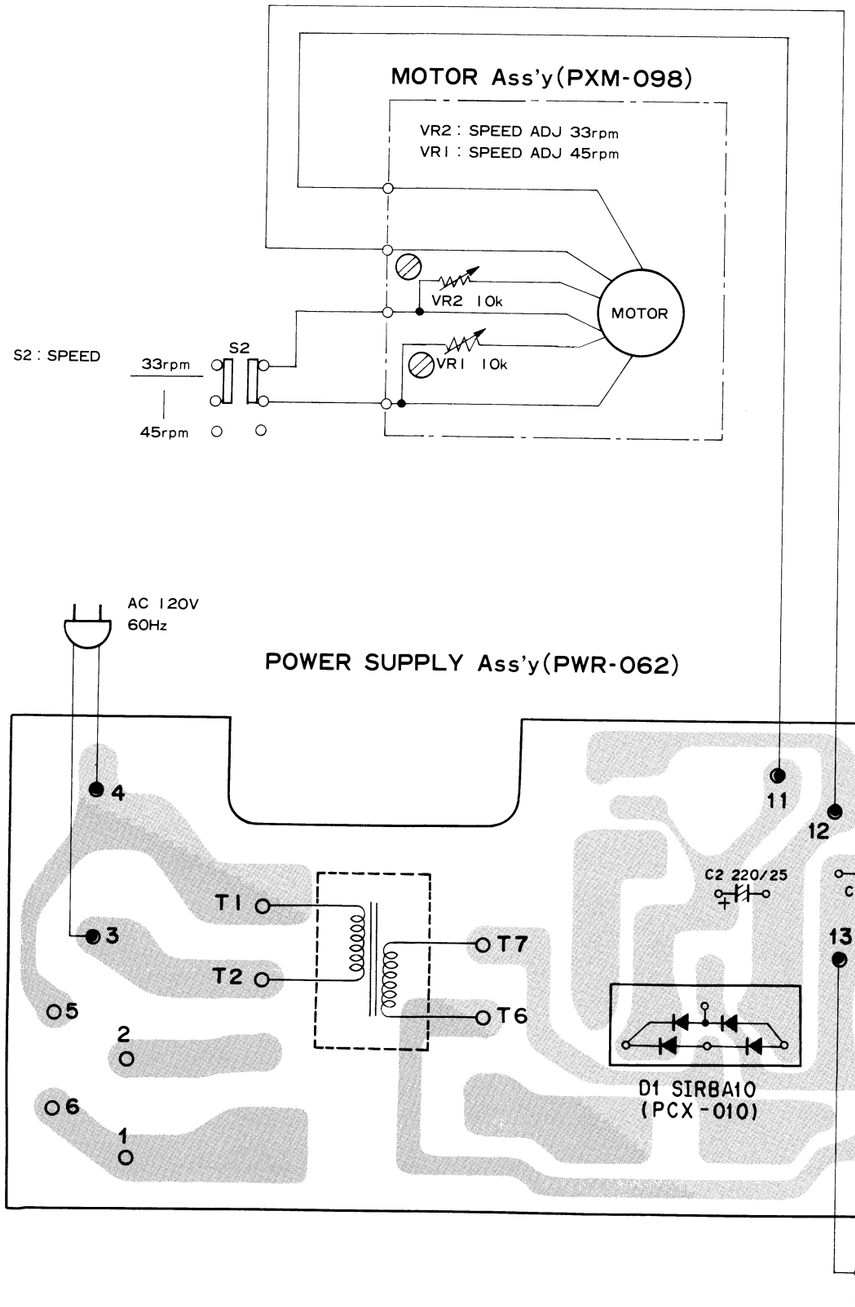
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

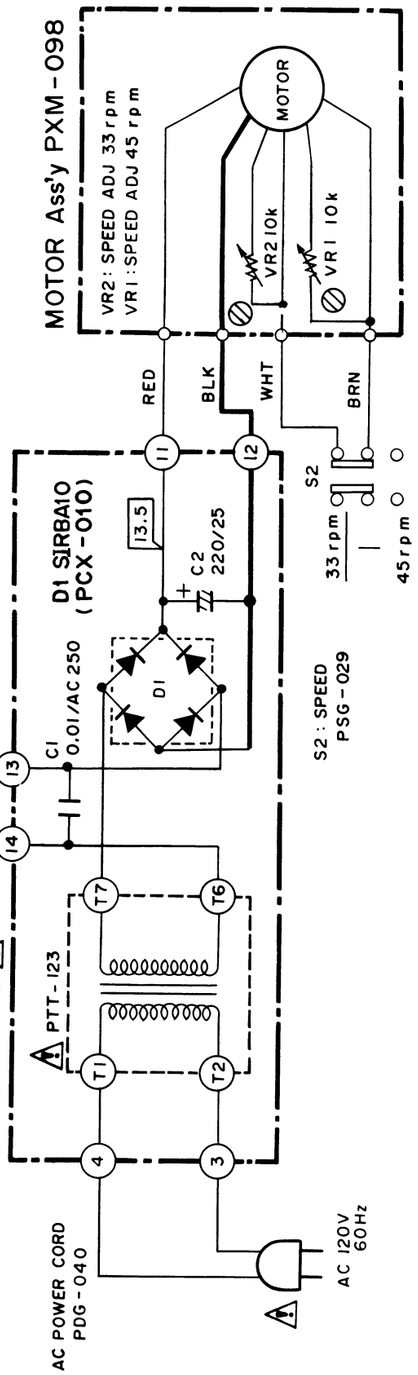
POWER SUPPLY ASSEMBLY (PWR-062)

Mark		Part No.	Symbol & Description	
⚠		PCL-040	C1	Capacitor
		CEA 221M 25L	C2	
	★	PCX-010 (WL02)	D1	
⚠	★	PTT-123		Power transformer (120V)

7. P.C.BOARD CONNECTION DIAGRAM



8. SCHEMATIC DIAGRAM



4. OTHERS:
   ⊘ : Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

   SWITCHES:

S1	POWER	ON — OFF
S2	SPEED	33 1/3 rpm — 45rpm

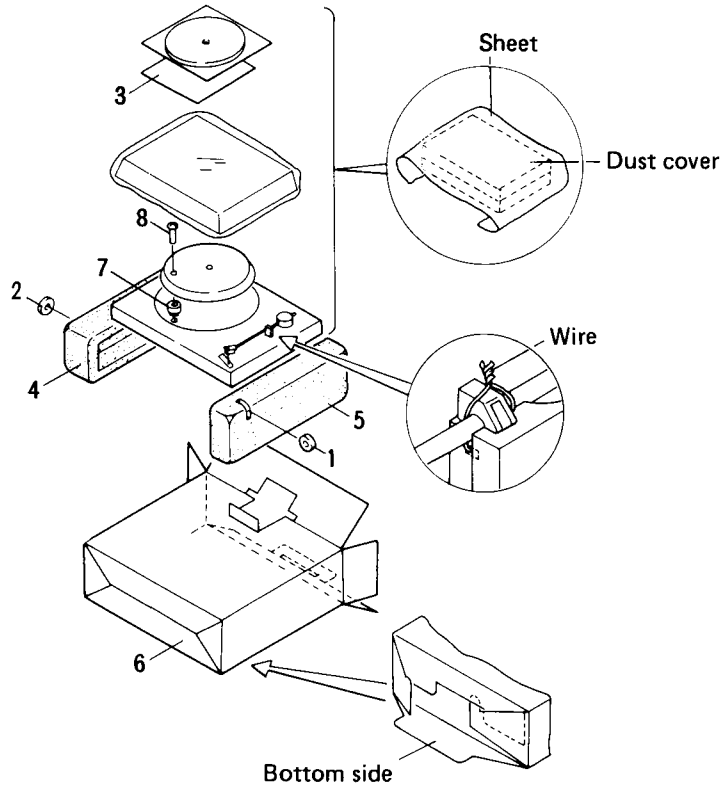
   The underlined indicates the switch position.

1. RESISTORS:
   Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ± 10%, (M) : ± 20% tolerance

2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
   Indication without voltage is 50V. except electrolytic capacitor.

3. VOLTAGE
   □ : DC voltage (V) at no input signal

9. PACKING



Parts List

Mark	No.	Part No.	Description
	1.	N93-603	45 adaptor
★★	2.	PXB-501	Weight assembly
	3.	PRB-193	Operating instructions
	4.	PHA-127	Protector (L)
	5.	PHA-128	Protector (R)
	6.	PHG-443	Packing case
	7.	PNX-294	Turntable platter packing
	8.	PBA-100	Screw

10. EXPLODED VIEWS

10.1 EXTERIOR

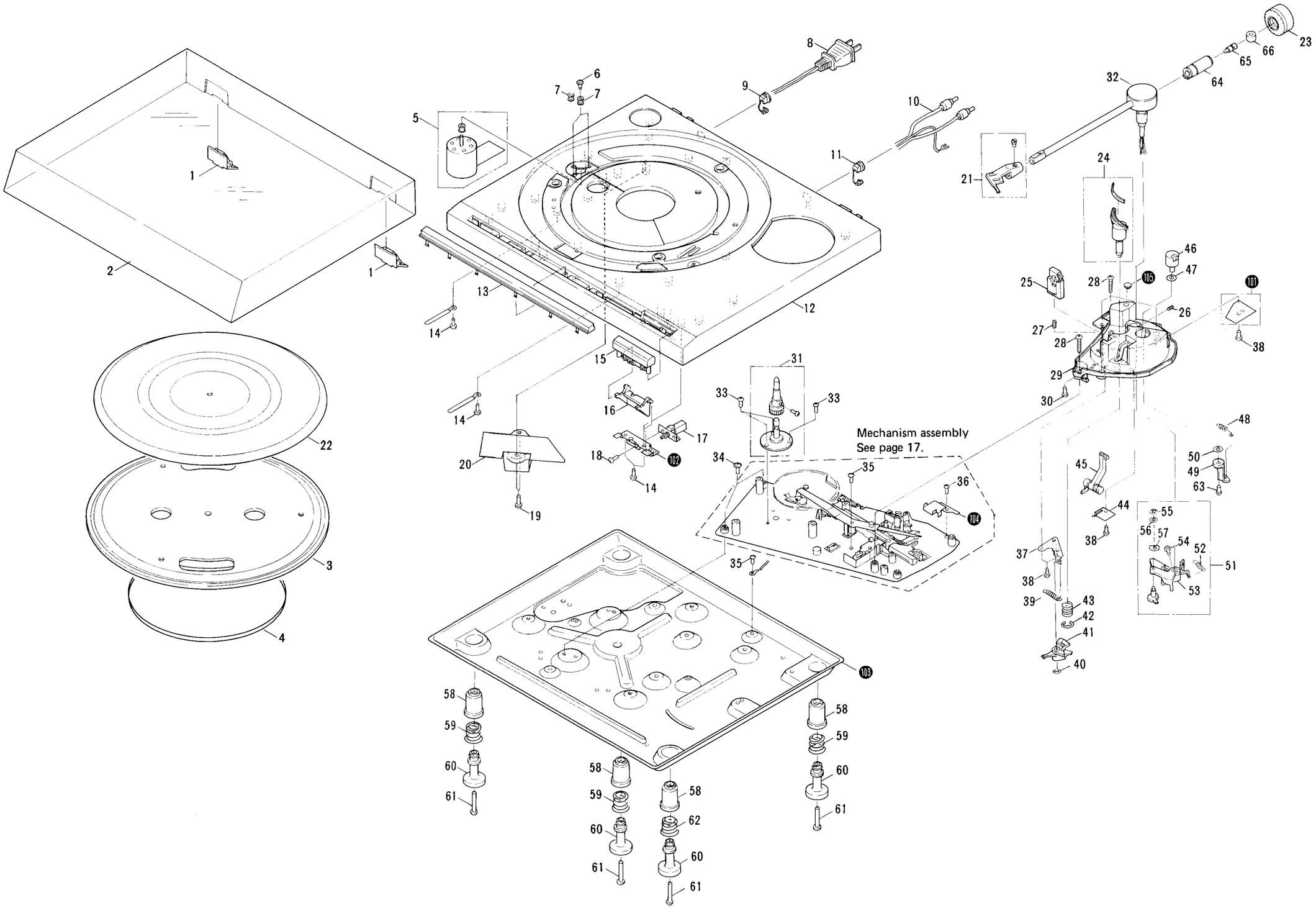
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List

Mark	No.	Part No.	Description
★	1.	PXB-155	Hinge assembly
★★	2.	PNV-034	Dust cover
	3.	PNR-166	Turntable platter
★★	4.	KEB-004	Belt
★★	5.	PYY-102	Motor assembly
	6.	PBA-112	Screw
	7.	PEB-172	Rubber cushion
⚠	8.	PDG-040	Power cord
	9.	PEC-058	Strain relief
	10.	PDE-064	PU cord
	11.	PEC-056	Strain relief
	12.	PNX-249	Panel
	13.	PAM-086	Front name plate (F)
	14.	PPZ30P080FMC	Screw
	15.	PAD-096	SP knob (D) unit
	16.	PNX-303	Switch lever (C)
★★	17.	PSG-029	Push switch
	18.	PMZ30P050FMC	Screw
	19.	IPZ30P160FMC	Screw
⚠	20.	PWR-062	Power supply assembly
	21.	PXA-882	Headshell assembly
	22.	PEA-057	Rubber mat assembly
	23.	PXM-501	Weight assembly
★	24.	PXB-227	EV sheet assembly
★	25.	PXB-247	Tonearm rest assembly
	26.	ZMD40H080FBT	Screw
	27.	ZMR30H 150FZK	Screw
	28.	PBA-108	Screw
	29.	PNX-341	Tonearm base
	30.	IPZ30P100FMC	Screw
	31.	PXB-177	Shaft assembly
★	32.	PPD-624	Tonearm assembly
	33.	PDZ30P080FMC	Screw
	34.	PBA-109	Screw
	35.	PDZ30P050FMC	Screw
	36.	PDZ30P050FMC	Screw
	37.	PXT-462	EV plate spring (B) unit
	38.	VBZ30P080FMC	Screw
	39.	PBH-238	EV cam spring
	40.	YE30S	E-type washer
	41.	PNX-339	EV cam
	42.	YE50S	E-type washer
	43.	PBH-293	EV spring
	44.	PBK-053	EV plate spring (A)
	45.	PNX-336	EV cam lever
	46.	PAC-100	AS knob
	47.	PBF-017	Washer
	48.	PBH-292	Spring
	49.	PNX-335	AS plate
	50.	PBE-012	AS spring washer
	51.	PXB-231	PU plate (B) assembly
	52.	PBH-308	PU plate spring
	53.	PNX-301	PU plate (A)
	54.	PMD40P080FMC	Screw
	55.	YS40FBT	Fixed washer
	56.	WC40FMC	Flat washer
	57.	PNC-227	PU spring washer
	58.	PEB-194	Damper cushion
	59.	PBH-311	Spring
	60.	PNX-293	Holder
	61.	PBA-118	Screw
	62.	PBH-312	Spring
	63.	VBZ30P150RMC	Screw
	64.	PXT-596	Weight shaft assembly
	65.	PBA-535	Screw
	66.	PNT-554	Rubber bush
	101.		PU cord assembly
	102.		Selector base (B)
	103.		Base
	104.		Protection plate
	105.		Rubber bush

Exterior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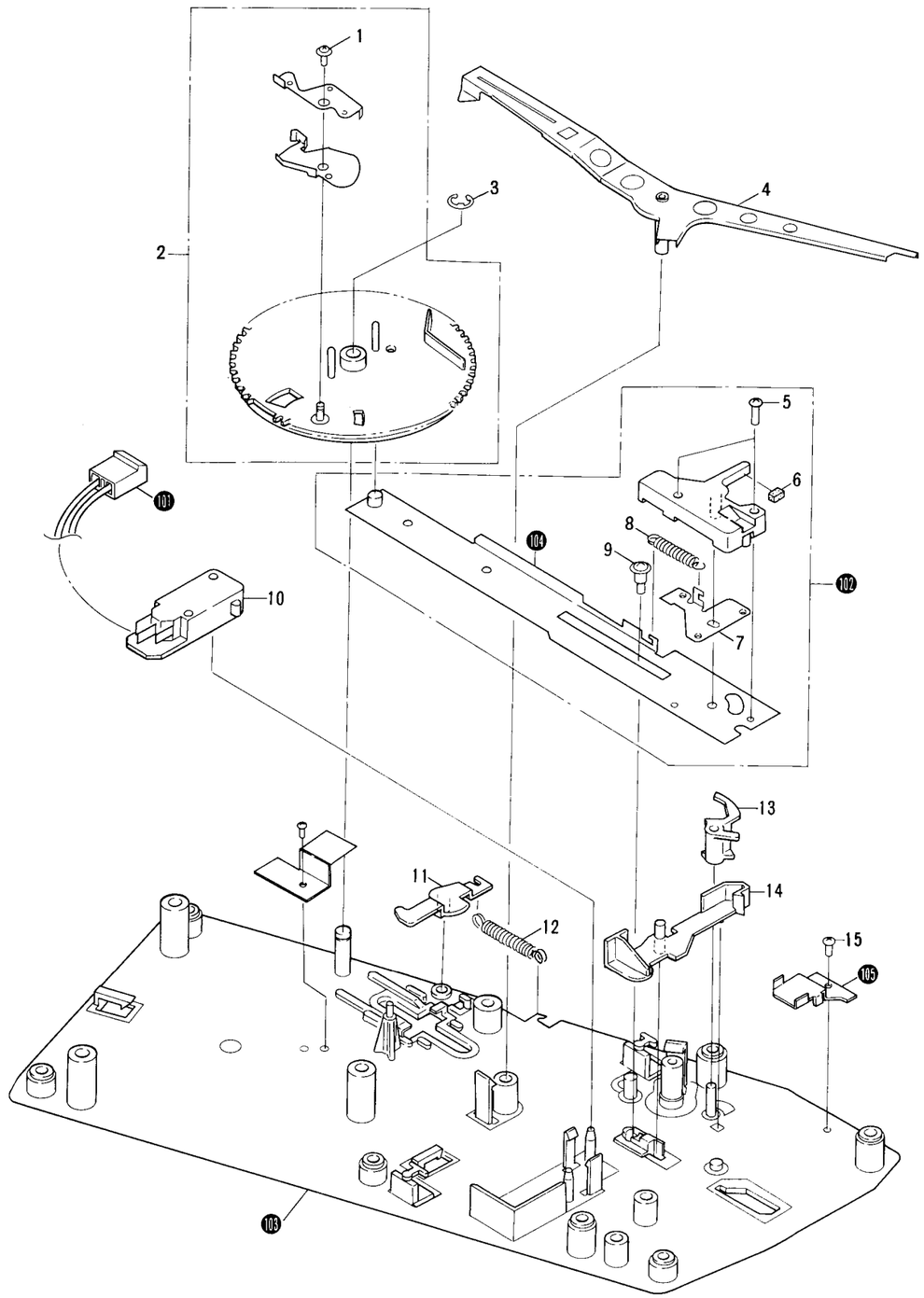
Mechanism assembly
See page 17.

10.2 MECHANISM ASSEMBLY



Parts List of Mechanism Ass'y

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	PBA-126	Screw		11.	PNX-035	Lock plate
	2.	PYY-100	Cam assembly		12.	PBH-225	Lock plate spring
	3.	YE40S	E-type washer		13.	PNX-031	Switch lock angle
	4.	PXT-446	Detector lever unit		14.	PNX-030	Switch lever
	5.	PMZ26P100FMC	Screw		15.	PDZ30P050FMC	
	6.	PEC-065	EV cam buffer		101.		Connector assembly
	7.	PNC-220	Start plate		102.		Driving plate assembly
	8.	PBH-224	Start plate spring		103.		Sub-panel unit
	9.	PBA-123	Screw		104.		Plate
⚠ ★★	10.	PSF-018	Microswitch		105.		Protection plate

11. ADJUSTMENTS

11.1 AUTO-RETURN ADJUSTMENT

1. Turn the auto return adjustment screw full around counter-clockwise.
2. When the auto return adjustment screw is turned back a little at a time clockwise, the tonearm will commence to return to the outer circumference.
3. Stop turning the adjustment screw once the stylus tip is 33mm away from the center shaft.
4. Once the above adjustment procedure has been completed, check that the tonearm returns automatically as designed.

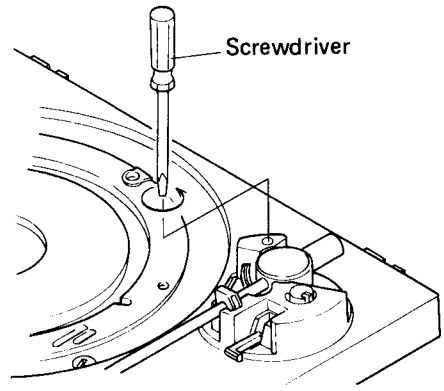


Fig. 11-1 Auto-return adjustment

11.2 ARM-ELEVATION ADJUSTMENT

To proceed with the elevation sheet height adjustment, insert the hexagonal wrench (for 3mm) into the hole at the front of the EV sheet and rotate it clockwise to reduce the height and counter-clockwise to increase the height. The height of the stylus tip from the record surface is 7 ±2mm.

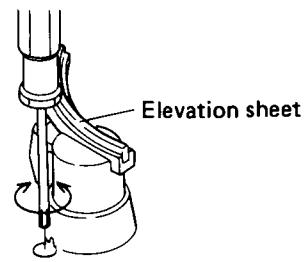


Fig. 11-2 Arm-elevation adjustment

11.3 MOTOR ADJUSTMENT

1. Turn the power on and start the turntable platter rotating.
2. Turn the speed adjustment knob around to the mechanically center position.
3. Adjust VR1 and VR2 in the motor assembly so that the stroboscope appears to be stationary. Again this adjustment is performed from below.
4. Adjust VR2 for 33 rpm speed, and VR1 for 45 rpm.
5. Always adjust at 33rpm.

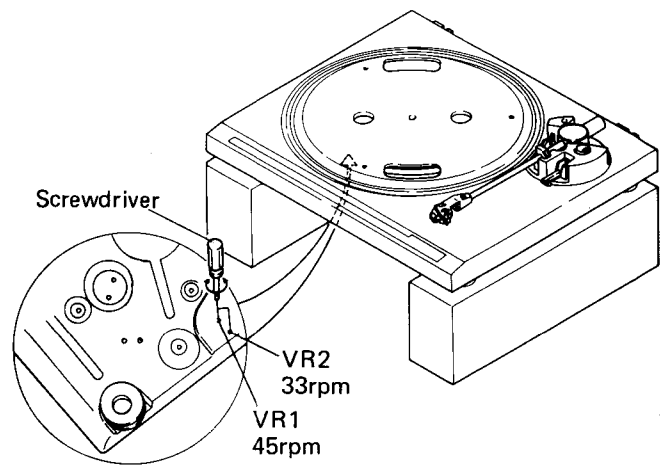


Fig. 11-3 Motor adjustment

11. RÉGLAGE

11.1 RÉGLAGE DU RETOUR AUTOMATIQUE DU BRAS

1. Tourner la vis de réglage du retour automatique du baas à fond dans le sens contraire des aiguilles d'une montre.
2. Lorsque la vis de réglage du retour automatique du bras est tournée d'une petite quantité dans le sens des aiguilles d'une montre, le bras de lecture commence à retourner vers la périphérie du plateau.
3. Arrêter de tourner la vis de réglage lorsque l'extrémité de la pointe de lecture se trouve à 33mm de l'axe central.
4. Lorsque le réglage décrit ci-dessus est terminé, vérifier que le bras de lecture retourne automatiquement de la manière désirée.

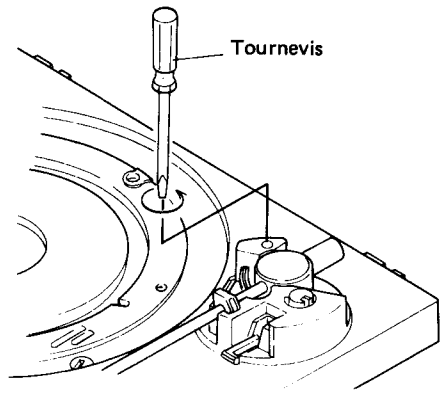


Fig. 11-1 Réglage du retour automatique du bras

11.2 RÉGLAGE DE LA MONTÉE DU BRAS

Pour régler la hauteur de la plaque de montée, introduire une clé hexagonale (de 3mm) dans le trou situé devant la plaque "EV" et la tourner dans le sens des aiguilles d'une montre pour réduire la hauteur, ou dans le sens contraire des aiguilles d'une montre pour augmenter la hauteur. La hauteur de l'extrémité de la pointe de lecture au-dessus de la surface du disque est de 7 ±2mm.

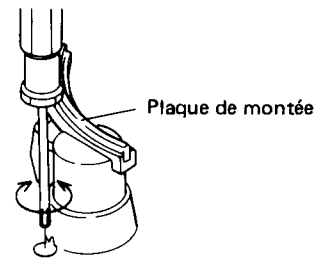


Fig. 11-2 Réglage de la montée du bras

11.3 RÉGLAGE DU MOTEUR

1. Enclencher l'alimentation et faire tourner le plateau du tourne-disque.
2. Tourner le bouton de réglage de vitesse sur la position mécanique centrale.
3. Régler VR1 et VR2 de l'assemblage moteur, de manière à ce que le motif du stroboscope paraissent immobile. De nouveau, ce réglage est réalisé depuis dessous.
4. Régler VR2 pour la vitesse de 33 tr/min, et VR1 pour la vitesse de 45 tr/min.
5. Régler la vitesse de rotation à partir de 33 tr/min.

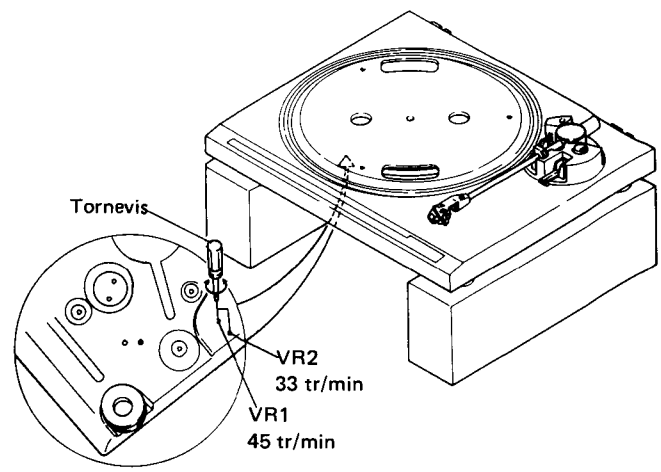


Fig. 11-3 Réglage du moteur

11. AJUSTE

11.1 AJUSTE PARA EL RETORNO AUTOMÁTICO

1. Girar el tornillo de ajuste del retorno automático completamente hacia la izquierda.
2. Cuando el tornillo de ajuste del retorno automático se gira un poco hacia la derecha, el brazo fonocaptor empezará a volver hacia la circunferencia exterior.
3. Dejar de girar el tornillo de ajuste cuando la punta de la aguja esté a 33mm del eje central.
4. Una vez realizado el ajuste arriba mencionado, comprobar que el brazo fonocaptor retorna automáticamente como se ha designado.

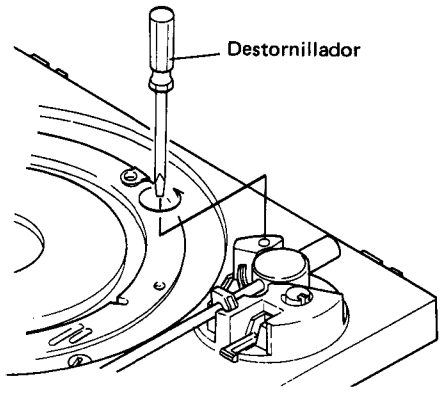


Fig. 11-1 Ajuste del retorno automático

11.2 AJUSTE DE LA ELEVACIÓN DEL BRAZO

Para proceder con el ajuste de la altura del dispositivo de elevación, insertar la llave de apriete hexagonal (de 3mm) en el orificio de la parte frontal del dispositivo de elevación y girarla hacia la derecha para reducir la altura y hacia la izquierda para aumentarla. La altura de la punta de la aguja desde la superficie del disco deberá ser de 7 ±2mm.

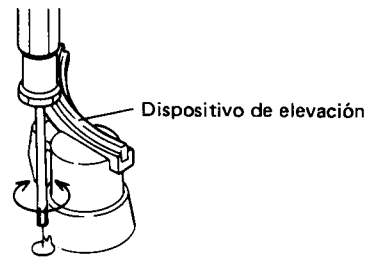


Fig. 11-2 Ajuste de la elevación del brazo

11.3 AJUSTE DEL MOTOR

1. Conectar la alimentación e iniciar la rotación del giradiscos.
2. Girar el mando de ajuste de la velocidad en torno a la posición central mecánicamente.
3. Ajustar VR1 y VR2 del conjunto del motor de modo que parezca que el estroboscopio está parado. Realizar de unevo este ajuste desde abajo.
4. Ajustar VR2 a 33 rpm y VR1 a 45 rpm.
5. Ajustar la velocidad de rotación a partir de 33 rpm.

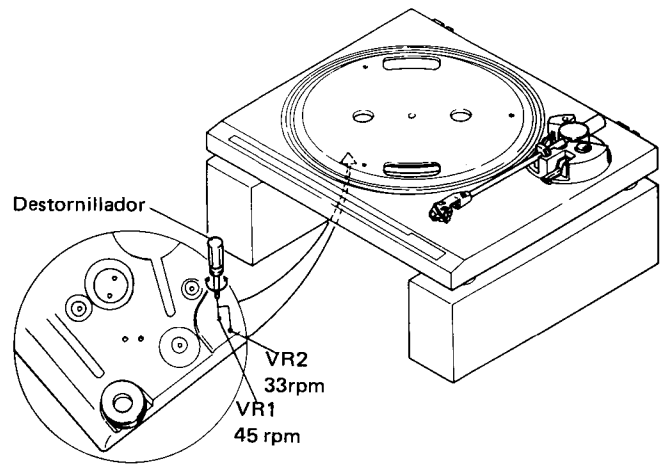


Fig. 11-3 Ajuste del motor